National Institute of Environmental Health Sciences

# Climate change promotes the emergence of serious disease outbreaks of filarioid nematodes

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**Abstract:**

Filarioid parasites represent major health hazards with important medical, veterinary, and economic implications, and considerable potential to affect the everyday lives of tens of millions of people globally (World Health Organization, 2007). Scenarios for climate change vary latitudinally and regionally and involve direct and indirect linkages for increasing temperature and the dissemination, amplification, and invasiveness of vector-borne parasites. High latitude regions are especially influenced by global climate change and thus may be prone to altered associations and dynamics for complex host-pathogen assemblages and emergence of disease with cascading effects on ecosystem structure. Although the potential for substantial ecological perturbation has been identified, few empirical observations have emanated from systems across the Holarctic. Coincidental with decades of warming, and anomalies of high temperature and humidity in the sub-Arctic region of Fennoscandia, the mosquito-borne filarioid nematode Setaria tundra is now associated with emerging epidemic disease resulting in substantial morbidity and mortality for reindeer and moose. We describe a host-parasite system that involves reindeer, arthropods, and nematodes, which may contribute as a factor to ongoing declines documented for this ungulate species across northern ecosystems. We demonstrate that mean summer temperatures exceeding 14 degrees C drive the emergence of disease due to S. tundra. An association between climate and emergence of filarioid parasites is a challenge to ecosystem services with direct effects on public health, sustainability of free-ranging and domestic ungulates, and ultimately food security for subsistence cultures at high latitudes.

**Source:** http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2919982

## Resource Description

**Exposure :**

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Security, Meteorological Factors, Temperature

**Food/Water Security:** Livestock Productivity

**Geographic Feature:**

resource focuses on specific type of geography

Arctic

**Geographic Location:** ☑

resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** Finland

**Health Impact:** ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

**Mitigation/Adaptation:** ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

**Model/Methodology:** ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

**Population of Concern:** A focus of content

**Other Vulnerable Population:** Subsistence hunters

**Resource Type:** ☑

format or standard characteristic of resource

Research Article

**Timescale:** ☑

time period studied

Time Scale Unspecified

**Vulnerability/Impact Assessment:** ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content